



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,910	11/13/2003	Kazuhiro Matsumoto	03560.003399.	7314
5514	7590	05/17/2005	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO			HO, ALLEN C	
30 ROCKEFELLER PLAZA			ART UNIT	
NEW YORK, NY 10112			PAPER NUMBER	

2882

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/705,910

Applicant(s)

MATSUMOTO, KAZUHIRO

Examiner

Allen C. Ho

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9 and 10 is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 052004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first moving unit and the second moving unit as claimed in claim 1 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites " the control unit controls the driving of the solid-image pickup unit so that the solid-image pickup unit accumulates and keeps at least one electrical charge". It is unclear what is the origin of the electrical charge. Furthermore, there is the question of when this electrical charge is created? This electrical charge could be an electrical charge stored in a solid-image pickup element that is yet to be read between two consecutive x-ray applications.

Claim 7 recites a projection-image generation unit for subtracting two items of image data from the image data stored in the storage unit. It is unclear what is meant by "two items".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2882

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Morita *et al.* (U. S. Patent No. 6,643,351 B2).

With regard to claims 1 and 2, Morita *et al.* disclosed an x-ray tomographic imaging apparatus comprising: an x-ray generation unit (R); a first moving unit for changing a direction in which the x-ray generation unit applies the x-ray and making the x-ray generation unit move (column 11, lines 34-61); a solid-image pickup unit (D) that includes a plurality of solid-image pickup elements and that converts the x-ray into at least one electrical signal (column 6, line 44 - column 7, line 67); a second moving unit for making the solid-image pickup unit move (column 11, lines 34-61); and a control unit (20) that controls the first move unit and the second move unit so that the x-ray generation unit applies the x-ray to predetermined coordinates on a light-receiving surface of the solid-image pickup unit, and that controls x-ray application performed by the x-ray generation unit and driving of the solid-image pickup unit, wherein the control unit controls the driving of the solid-image pickup unit so that the solid-image pickup unit accumulates and keeps at least one electrical charge (1. Electrons and ions in the solid-image pickup unit carry electrical charges; 2. Since image cells are selectively read, there are electrical charges in the un-read image cells.) while the x-ray generation unit repeats the x-ray application a predetermined number of times, or over a predetermined period of time (column 5, lines 55-66).

6. Claim 8 is rejected under 35 U.S.C. 102(b) as being anticipated by Spivey *et al.* (U. S. Patent No. 5,528,043).

7. With regard to claim 8, Spivey *et al.* disclosed an x-ray tomographic imaging apparatus comprising: a solid-image pickup unit (1) that can convert each of the x-ray projection images to

Art Unit: 2882

a signal and read the signal in a non-destructive reading manner; and a control unit (20) for making the solid-image pickup unit accumulate the signals of the x-ray projection images and read the signals in a non-destructive reading manner during the signal accumulation (page 5, lines 6-38).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morita *et al.* (U. S. Patent No. 6,643,351 B2) as applied to claim 1 above, and further in view of Orava *et al.* (U. S. Patent No. 5,812,191).

With regard to claims 4 and 5, Morita *et al.* disclosed the x-ray tomographic imaging apparatus according to claim 1, further comprising: an analog-to-digital conversion unit (it is required to convert an output from the solid-image pickup unit into digital format so that it may be utilized by the data processor 50); a storage unit (52) for keeping the image data that is output from the analog-to-digital conversion unit at predetermined time intervals.

However, Morita *et al.* failed to disclose a gray-scale adjuster unit for performing gray-scale conversion for the image data stored in the storage unit by using a predetermined gray scale conversion function.

Orava *et al.* disclosed a gray-scale adjuster unit that optimizes the display of captured images; the gray-scale adjuster unit determines a gray scale conversion function based on the maximum value and the minimum value of the image data (column 6, lines 1-18).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a gray-scale adjuster unit, since a person would be motivated to obtain the most out of the captured images by optimizing the display of captured images.

With regard to claim 6, Morita *et al.* in combination with Orava *et al.* disclosed the x-ray tomographic imaging apparatus according to claim 4, further comprising a display unit (60).

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morita *et al.* (U. S. Patent No. 6,643,351 B2) as applied to claim 1 above, and further in view of Schultz (U. S. Patent No. 6,069,933).

With regard to claim 7, Morita *et al.* disclosed the x-ray tomographic imaging apparatus according to claim 1, further comprising: an analog-to-digital conversion unit (it is required to convert an output from the solid-image pickup unit into digital format so that it may be utilized by the data processor 50); a storage unit (52) for keeping the image data that is output from the analog-to-digital conversion unit at predetermined time intervals.

However, Morita *et al.* failed to disclose a projection-image generation unit for subtracting two items of image data from the image data stored in the storage unit.

Schultz taught that items of image information can be subtracted from one another in the process of combining these items of image information to suppress certain image features (column 4, lines 43-52).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a projection-image generation unit for subtracting two items of image data from the image data stored in the storage unit, since a person would be motivated to suppress certain undesired image features.

Allowable Subject Matter

11. Claims 9 and 10 are allowed.

12. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 9 and 10, although the prior art discloses an x-ray tomographic imaging method comprising the step of performing accumulation control for making the solid image pickup unit accumulate the signal of each of the x-ray projection images, it fails to teach or fairly suggest the step of performing read control for making the solid-image pickup unit read the signal in a non-destructive reading manner during the signal accumulation as claimed.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Oikawa (U. S. Patent No. 6,411,674 B1) disclosed a radiation tomography device.
- (2) Baetz *et al.* (U. S. Patent No. 6,341,156 B1) disclosed an x-ray diagnostic apparatus with relatively moved x-ray source and detector.
- (3) Niklason *et al.* (U. S. Patent No. 5,872,828) disclosed a tomosynthesis system for breast imaging.

Art Unit: 2882

- (4) Bunch (U. S. Patent No. 4,095,110) disclosed a linear tomographic system comprising an x-ray film stepped in a direction opposite to position change of the source.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen C. Ho
Primary Examiner
Art Unit 2882

12 May 2005